

Claims

1.

1 A blow molded plastic hot-fill container that includes at least one vacuum panel for
2 inward flexure under vacuum, wherein said vacuum panel is externally concave as viewed in cross
3 section from a first direction and externally convex as viewed in cross section from a second
4 direction orthogonal to said first direction.

2.

1 The container set forth in claim 1 wherein said container has a sidewall extending
2 from a base to a neck finish, and wherein said at least one vacuum panel is disposed in said sidewall.

3.

1 The container set forth in claim 2 including a base for supporting the container, a
2 body extending from said base, a dome extending from said body and a neck finish extending from
3 said dome, wherein said at least one vacuum panel is disposed in said dome.

4.

1 The container set forth in claim 2 wherein said sidewall, including said at least one
2 vacuum panel, is of generally uniform wall thickness.

5.

1 The container set forth in claim 4 wherein said at least one vacuum panel includes
2 an array of vacuum panels at uniform spacing around an axis of said container.

6.

1 The container set forth in claim 5 wherein said vacuum panels are separated from
2 each other by circumferentially spaced ribs.

7.

1 The container set forth in claim 6 wherein said ribs have external surfaces on a
2 common surface of revolution, and wherein said vacuum panels are recessed radially inwardly from
3 said surface of revolution.

8.

1 A blow-molded plastic hot-fill container that includes:
2 a base for supporting the container, a body extending from said base, a dome
3 extending from said body and a neck finish extending from said dome,
4 wherein said dome includes an array of vacuum panels, each of said vacuum panels
5 being externally concave as viewed in cross section from a first direction and externally convex as
6 viewed in cross section from a second direction orthogonal to said first direction.

9.

1 The container set forth in claim 8 wherein said vacuum panels are externally concave
2 in cross section as viewed tangentially of said dome and externally convex in cross section as
3 viewed axially of said dome.

10.

1 The container set forth in claim 8 wherein said dome, including said array of vacuum
2 panels, is of generally uniform wall thickness.

11.

1 The container set forth in claim 8 wherein said vacuum panels are separated from
2 each other by circumferentially spaced ribs in said dome.

12.

1 The container set forth in claim 11 wherein said ribs are connected to annular rings
2 that encircle said dome above and below said vacuum panels, wherein said ribs have external
3 surfaces on a common surface of revolution, and wherein said vacuum panels are recessed radially
4 inwardly from said surface of revolution.

13.

1 A blow-molded plastic hot-fill container that includes:

2 a base for supporting the container, a body extending from said base, a dome
3 extending from said body and a neck finish extending from said dome,

4 wherein said dome includes an array of flexible resilient vacuum panels separated
5 from each other by circumferentially spaced ribs,

6 wherein each of said vacuum panels is externally concave as viewed in cross section
7 from a first direction and externally convex is viewed in cross section from a second direction
8 orthogonal to said first direction, and

9 wherein said dome, including said array of vacuum panels, is of generally uniform
10 wall thickness and circular in cross section.

14.

1 The container set forth in claim 13 wherein said vacuum panels are externally
2 concave in cross section as viewed tangentially of said dome and externally convex in cross section
3 as viewed axially of said dome.

15.

1 The container set forth in claim 13 wherein said ribs are connected to annular rings
2 that encircle said dome above and below said vacuum panels, wherein said ribs have external
3 surfaces on a common surface of revolution, and wherein said vacuum panels are recessed radially
4 inwardly from said surface of revolution.

16.

1 A method of making a hot-fill plastic container that includes the step of blow
2 molding a container having at least one vacuum panel for inward flexure under vacuum, wherein
3 said vacuum panel is externally concave as viewed in cross section from a first direction and
4 externally convex as viewed in cross section from a second direction orthogonal to said first
5 direction.

17.

1 A container made in accordance with the method set forth in claim 16.

18.

1 A method of making a hot-fill plastic container that includes the step of blow
2 molding a container having a base for supporting the container, a body extending from said base,
3 a dome extending from said body and a neck finish extending from said dome, wherein said dome
4 includes an array of vacuum panels, each of said vacuum panels being externally concave as viewed

5 in cross section from a first direction and externally convex as viewed in cross section from a second
6 direction orthogonal to said first direction.

19.

1 The method set forth in claim 18 wherein said container is blow molded from a
2 preform.

20.

1 The method set forth in claim 19 wherein said vacuum panels are externally concave
2 in cross section as viewed tangentially of said dome and externally convex in cross section as
3 viewed axially of said dome.

21.

1 The method set forth in claim 19 wherein said dome, including said array of vacuum
2 panels, is of generally uniform wall thickness.

22.

1 The method set forth in claim 18 wherein said vacuum panels are separated from
2 each other by circumferentially spaced ribs in said dome.

23.

1 The method set forth in claim 22 wherein said ribs are connected to annular rings that
2 encircle said dome above and below said vacuum panels, wherein said ribs have external surfaces
3 on a common surface of revolution, and wherein said vacuum panels are recessed radially inwardly
4 from said surface of revolution.

24.

1 A molded plastic container made in accordance with the method set forth in claim

2 19.

25.

1 A molded plastic container made in accordance with the method set forth in claim

2 18.